UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Mark J. Cartwright, President
USC Saltville Brine, LLC
4800 San Felipe
Houston, Texas 77056-3908

010715

RE: Underground Injection Control (UIC) Permit VAS3G931BSMY

Dear Mr. Cartwright:

As a follow up to our site visit and discussion on November 4, 2014 and November 5, 2014 the following is required to maintain compliance with the above referenced permit.

For recently completed Well 2 and Well 3:

1. At a minimum, the following logs and/or tests shall be conducted during the drilling and construction of each injection well: For surface casing intended to protect underground sources of drinking water: gamma ray, resistivity, and caliper prior to the casing being installed and a cement bond/variable density or temperature log after the casing is set and cemented. For the long string casing: gamma ray, resistivity, and caliper prior to the casing being installed and a cement bond/variable density or temperature log after the casing is set and cemented.

2. The Permittee shall submit a narrative report that interprets log and/or test results which specifically relate to the results of the cementing operation. Further, the narrative shall detail the rationale used to make these interpretations. The narrative report shall be prepared by a knowledgeable log analyst and submitted to the Director. The Director may prescribe additional logs or waive logging requirements in the future should field conditions so warrant.

For Well 131:

1. A color copy of the Radiological Tracer Log.

For Wells 13, 14, 15, and 1A:

1. Conduct an approved mechanical integrity test (MIT) for each well by August 31, 2015. During the last round of testing the gauges onsite and test methods were

not adequate to accurately perform the previously proposed Diesel Brine Interface test.

2. At least 30 days prior to conducting the test provide EPA with a detailed written description of proposed test method for each well. We recommend you closely follow the procedure outlined in the attached MIT testing performed several years ago.

3. Well 15 is temporary abandoned. Since it is no longer in operation it will require a MIT every two years.

For Wells 9 and 17:

1. MITs are due for these wells by August 31, 2015.

If you should have questions regarding the permit, its conditions or other UIC procedures, please give me a call at 215-814-5469.

Sincerely,

James C. Bennett
Ground Water and Enforcement Branch (3WP22)
Office of Drinking Water & Source Water Protection

PB Energy Storage Services, Inc
ENGINEERING - CONSTRUCTION - OPERATIONS - MAINTENANCE

11757 Katy Freeway, Suite 600
Houston, Texas 77079

(281) 496-5590
Fax (281) 496-5865
www.pbenergy.com

March 9, 2006

Mr. Scott Hill
Virginia Gas Company/Duke Energy
1096 Ole Berry Dr.
Abingdon, Va 24210

Re: Mechanical Integrity Test Results for Saltville Brine Wells CH-13B and CH-14A

Dear Mr. Hill:

PB Energy Storage Services, Inc. (PB ESS) has completed processing the Mechanical Integrity Tests (MIT) data for Saltville Brine Wells CH-13B and CH-14A. The wells were tested using the EPA water/brine interface method modified for diesel/brine interface. The following documents are attached:

- Mechanical Integrity Test Data for Well CH-13B – Test Sheet and Pressure Graph
- Mechanical Integrity Test Data for Well CH-14A – Test Sheet and Pressure Graph
- EPA approved MIT procedure used for the MIT, with well schematics for each well.

TEST CHRONOLOGY

Virginia Gas pressured the two-well cavern gallery by injecting brine into Well CH-14A. Brine injection was started on February 21, 2006 and ended on February 23, 2006 with the Well CH-14A wellhead pressure at approximately 385 psig (by gauge). Well CH-13B wellhead pressure was approximately 360 psig (by gauge). The wells were shut in and the cavern was allowed to stabilize.

PB ESS installed digital recorders on each of the wells to read both 9-5/8"x4-1/2" annulus and 4-1/2" tubing pressures. Well Test Solutions SDS Series 3000 digital pressure recorders were used. These recorders are capable of measuring pressures to .001 psi with an accuracy of 0.024% FS and a pressure resolution of 0.0003% FS. Data sampling rates were set at 5 minute intervals. On February 27, 2006, 96 bbls of diesel was injected into the annulus of Well CH-14A and 95 bbls was injected into the annulus of Well CH-13B. These injected diesel volumes placed the diesel/brine interface below the casing shoe of each well. (Refer to MIT procedure well schematics). The wells were then shut in and allowed to stabilize. Virginia Gas downloaded the digital data daily and e-mailed the files to PB ESS for analysis. Analysis of pressure data for March 3, 2006 indicated a successful 8-hour test for both wells.

TEST RESULTS

The EPA procedure specifies that a well demonstrates mechanical integrity when the Net Pressure Change Rate (NPCR) is below 0.05 psi/hr over an 8-hour period. The following are the NPCR calculations for each well, derived from the attached test data sheets.

WELL CH-13B

$$P_{Start} = P_{StartTestWell} - P_{Start\,Re\,fWell}$$
$$P_{Start} = 617.88psig - 375.712psig$$
$$P_{Start} = 242.168psi$$
$$NPCR = \frac{(P_{Start} - P_{End})}{TestLength}$$

$$P_{End} = P_{EndTestWell} - P_{End\,Re\,fWell}$$
$$P_{End} = 617.435psig - 375.241psig$$
$$P_{End} = 242.194psi$$
$$NPCR = \frac{(242.168psi - 242.194psi)}{8hours}$$

$$8\text{-}HOUR\ TEST\ NPCR = -0.003psi/hour$$

Test Gradient = 0.749 psi/ft to 9-5/8" production casing shoe @ 1621'

WELL CH-14A

$P_{Start} = P_{StartTestWell} - P_{Start\,Ref\,fWell}$

$P_{Start} = 615.408\,psig - 387.69\,psig$

$P_{Start} = 227.718\,psi$

$P_{End} = P_{EndTestWell} - P_{End\,Ref\,fWell}$

$P_{End} = 614.884\,psig - 387.213\,psig$

$P_{End} = 227.671\,psi$

$NPCR = \frac{(P_{Start} - P_{End})}{TestLength}$

$NPCR = \frac{(227.718\,psi - 227.671\,psi)}{8hours}$

8-HOUR TEST NPCR = 0.006 psi / hour

Test Gradient = 0.756 psi/ft to 9-5/8" production casing shoe @ 1586'

Note: Test gradient calculations assume diesel specific gravity = 0.85.

Both Saltville Brine Wells CH-13B and CH-14A have met the EPA criteria for a successful mechanical integrity test for Class III salt solution mining injection wells, i.e. the calculated NPCR for an 8-hour test is less than 0.05 psi/hr. Also, test results indicated NPCR's of less than 0.020 psi/hr for the 2-hour test intervals for each well. (See attached Test Sheets.)

If you have any questions regarding the processed MIT data for these wells, please call or e-mail me.

Sincerely,

Tim Moran
Manager of Engineer

Attachments

CC: PB ESS File w/attachments

Mechanical Integrity Test Sheet

Date	March 3, 2006
Location	Virginia Gas/Duke Energy - Saltville, Va.
Well	Brine Well CH-13B
Comments:	MIT using EPA Water/Brine Interface Method - Modified for Diesel/Brine Interface

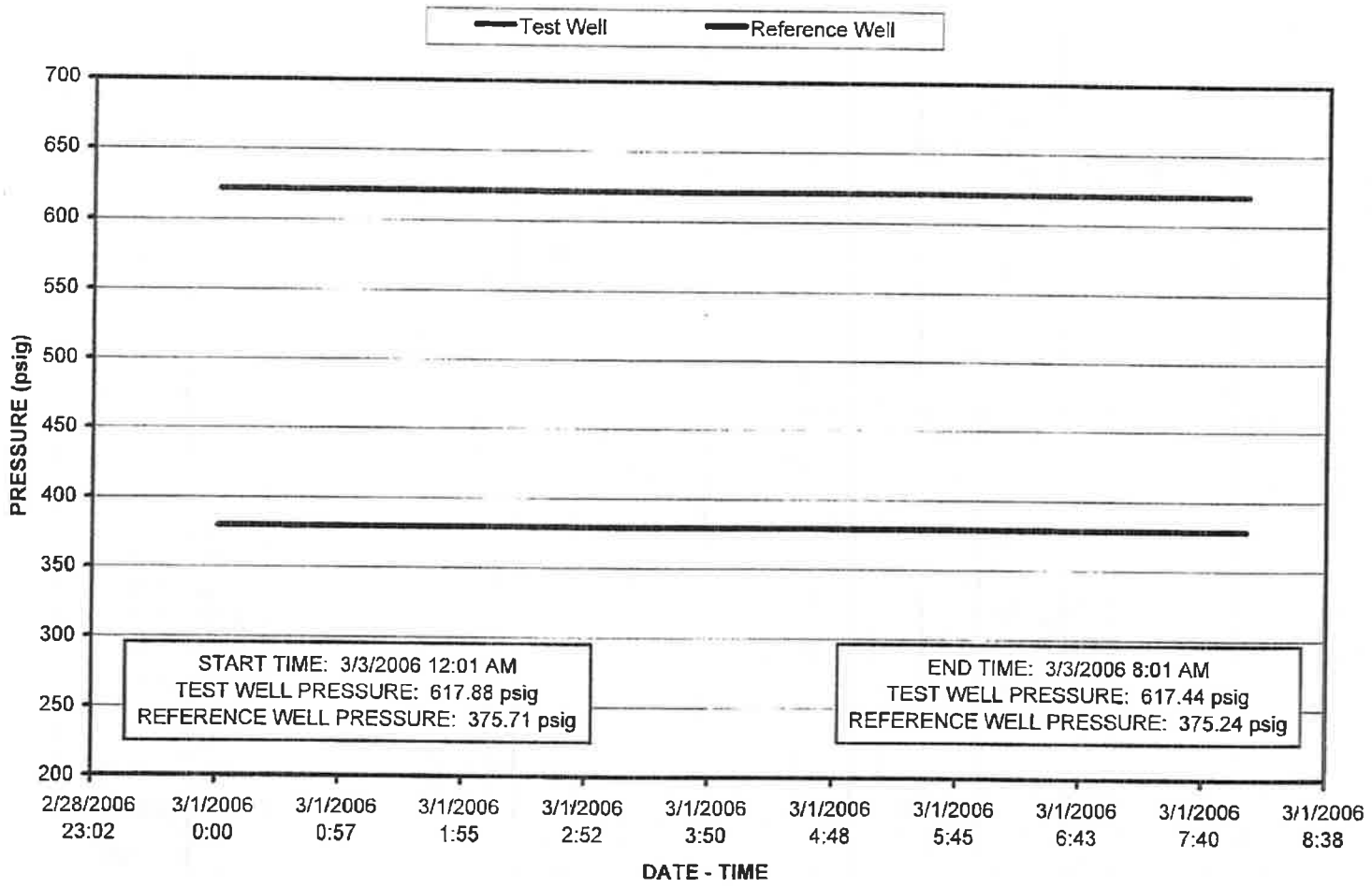
Test Well			Reference Well	
9-5/8"x4-1/2" Annulus (Diesel)			4-1/2" Tubing (Brine)	
Time	Pressure		Time	Pressure
0:01	617.88		0:01	375.712
1:01	617.764		1:01	375.598
2:01	617.709		2:01	375.538
3:01	617.661		3:01	375.49
4:01	617.622		4:01	375.447
5:01	617.604		5:01	375.387
6:01	617.555		6:01	375.34
7:01	617.514		7:01	375.293
8:01	617.435		8:01	375.241

TEST PERIOD		2-HOUR NPCR
Test Period 1		-0.001
Test Period 2		-0.002
Test Period 3		-0.020
Test Period 4		0.011
		8-HOUR NPCR
8 Hour Test		-0.003

PB Energy Storage Services, Inc.
ENGINEERING · CONSTRUCTION · OPERATIONS · MAINTENANCE

Signatures	
PB ESS Approval	
Operator Approval	

MIT SALTVILLE BRINE WELL CH-13B



Mechanical Integrity Test Sheet

Date	March 3, 2006
Location	Virginia Gas/Duke Energy - Saltville, Va.
Well	Brine Well CH-14A
Comments:	MIT using EPA Water/Brine Interface Method - Modified for Diesel/Brine Interface

Test Well			Reference Well	
9-5/8"x4-1/2" Annulus (Diesel)			4-1/2" Tubing (Brine)	
Time	Pressure		Time	Pressure
0:02	615.408		0:02	387.69
1:02	615.265		1:02	387.553
2:02	615.175		2:02	387.488
3:02	615.154		3:02	387.446
4:02	615.09		4:02	387.399
5:02	615.058		5:02	387.358
6:02	614.966		6:02	387.297
7:02	614.934		7:02	387.266
8:02	614.884		8:02	387.213

TEST PERIOD		2-HOUR NPCR
Test Period 1		0.016
Test Period 2		-0.002
Test Period 3		0.011
Test Period 4		-0.001
		8-HOUR NPCR
8 Hour Test		0.006

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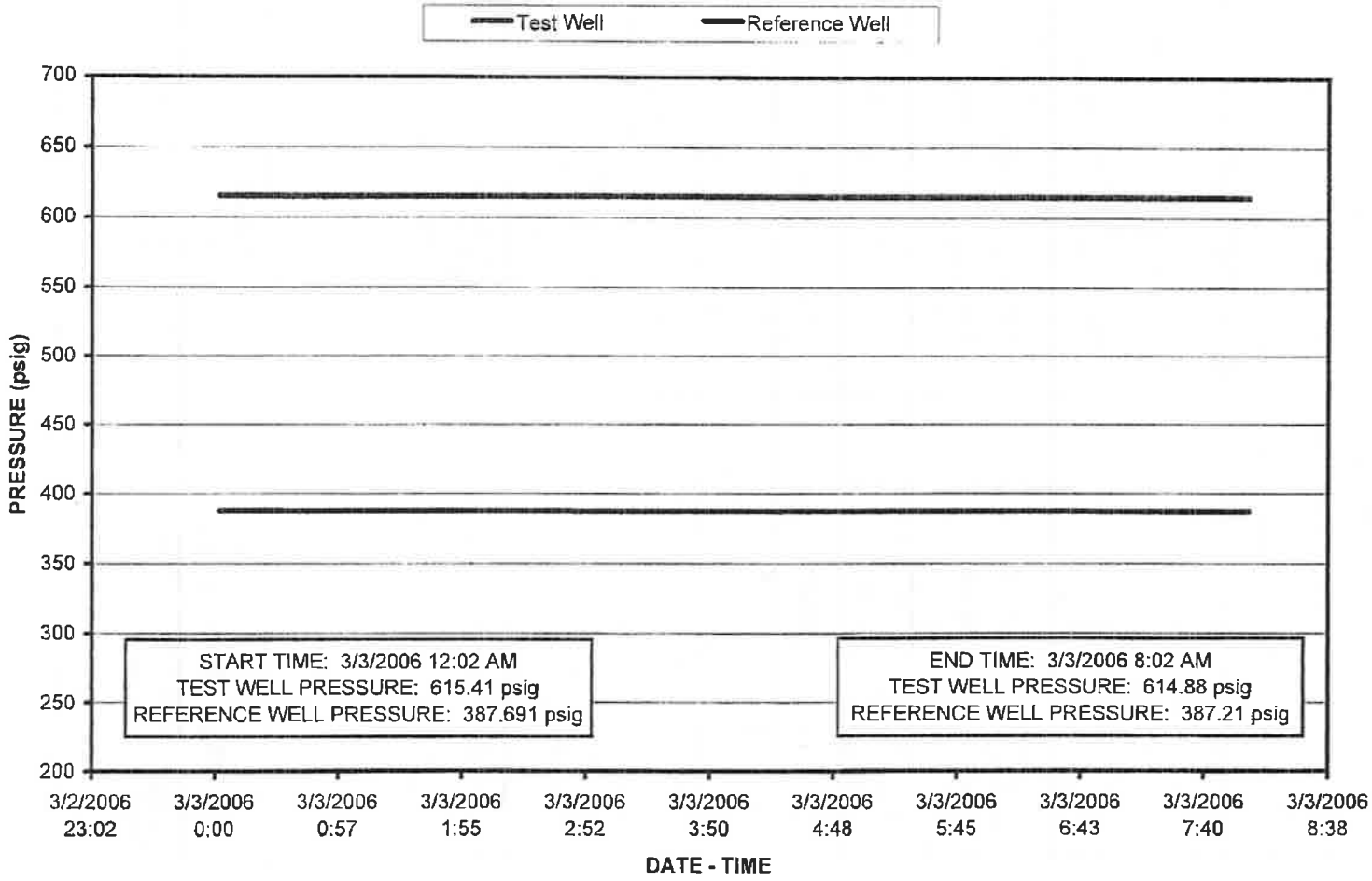
Signatures	
PB ESS Approval	
Operator Approval	

MIT SALTVILLE BRINE WELL CH-14A



1.0 INTRODUCTION

This program presents the proposed steps for completing a modified water/brine interface EPA approved Mechanical Integrity Test (MIT) for the Duke Energy Gas Transmission (DEGT)/Virginia Gas Company brine wells CH-13B and 14A. These steps are intended as a guideline for the MIT. Actual conditions encountered during the work will dictate the appropriate action to be taken. Any significant deviation from the proposed program will require prior approval by DEGT and PB ESS.

The purpose of the Mechanical Integrity Test (MIT) procedure is to test the mechanical integrity of the underground storage cavern to determine the suitability for leaching operations. In summary, the test procedure consists of the following basic steps: Fill the cavern with brine and pressure up to approximately 275 psi, allow the cavern to stabilize; inject a volume of diesel blanket material in each well sufficient to place the diesel/brine interface in the borehole below the casing shoe but above the cavern roof, and record wellhead pressures for a given test period to evaluate the integrity of the wells. (See attached well schematics.)

Reference 40 CFR Part 146, Water Brine Interface Mechanical Integrity Test for Class III Salt Solution Mining Injection Wells. The EPA procedure was modified to better represent the operating conditions with a diesel blanket at the roof of the cavern.

2.0 PREPARATION

2.1 Provide a connection to allow for the injection of brine through the 4-1/2" wash string.

2.2 Install pressure-monitoring equipment on well connections to allow continuous monitoring of diesel and brine wellhead pressures.

NOTE: Digital pressure recorders and a deadweight tester (digital or standard) utilized for the mechanical integrity test shall be calibrated in accordance with manufacturer specifications and traceable to National Bureau of Standard.

2.3 Provide a top connection on the wellhead (2" I.D. minimum) to permit installing a wireline lubricator for well logging, if required.

2.4 Provide a connection to allow for the injection of diesel blanket material.

2.5 Pre-pressure the cavern by injecting brine into the 4-1/2" hanging string of one well. Monitor pressures at both wells and measure and record the volume of brine injected and specific gravity of brine samples injected. Pressurize the cavern to approximately 375 psig. Allow the cavern to stabilize. See attached Well MIT data sheets for estimated brine test pressures.

2.6 Fill a frac tank with diesel and rig up a pump truck with meter to inject diesel into one well. Inject the required volume of diesel to fill the 9-5/8" x 4-1/2" annulus to the casing shoe. Inject an additional volume of diesel to place the interface in the borehole below the casing shoe. (See attached MIT Well Schematics Wells CH-13B and 14A for diesel volumes.) This volume should place the diesel/brine interface approximately 40' below the casing shoe in the borehole annulus. Injection rates should be kept to a minimum to prevent mixing of wellbore fluids. Injected volume to be metered or determined by tank

volume. Diesel test pressure must be greater than the normal operating pressure of the diesel blanket during leaching. Repeat diesel injection for the second well.

2.7 Measure and record the volume of diesel injected and the wellhead pressures at 5-minute intervals.

2.8 Wait a minimum of 36 hours for temperature stabilization before initializing the test. Wellhead pressures and surface temperatures should be continuously monitored during the stabilization period. Digital recording equipment to collect pressure samples on 5-minute intervals.

3.0 TEST PERIOD

3.1 Monitor the wellhead pressures for the test well (9-5/8" X 4-1/2" annulus) and the reference well (4-1/2" casing) continuously during the test period for each well. Digital recording equipment to collect pressure samples on 5-minute intervals.

3.2 Report and record wellhead pressures each hour for an 8-hour test period after the temperature stabilization period.

3.3 Calculate the net pressure change for each hour interval using the following equations:

INITIAL TEST PRESSURE CALCULATION

$$P_{Initial} = P_{StartTestWell} - P_{StartReferenceWell}$$

FINAL TEST PRESSURE CALCULATION

$$P_{Final} = P_{EndTestWell} - P_{EndReferenceWell}$$

NET PRESSURE CHANGE RATE CALCULATION

$$NPCR = \frac{(P_{Initial} - P_{Final})}{TestLength}$$

Calculate the pressure change for each hourly test period and for the entire 8-hour test period.

3.4 Well has demonstrated mechanical integrity if the Net Pressure Change Rate (NPCR) is less than 0.05 psi/hr. Present the data in a standard format.

3.6 Determine the duration of the test using the appropriate test data and calculations.

4.0 TEST INITIALIZATION

4.1 Record the test and reference wellhead pressures with a digital pressure recorder at the start of the test. Digital pressure recorder to sample the wellhead pressures in 5-minute intervals.

4.2 Calculate the NPCR for the last test interval to determine if the test period should begin.

5.0 TEST FINALIZATION

5.1 Record the test and reference wellhead pressures with a digital pressure recorder at the end of the test period.

5.2 Calculate the NPCR for each test interval and the test period.

6.0 REPORT ON TEST RESULTS

6.1 Prepare a written report presenting test procedures, results and conclusions, along with a chronology of test activity, wellhead pressure records, and supporting calculations.

M.I.T. WELL DATA SHEET

Rev. 2

1.0 WELL DESCRIPTION

1.1	Well Name		WELL #14A
1.2	Operator		Virginia Gas
1.3	Location	Field	Saltville
		County	Smyth
		State	Virginia
1.4	Cemented Production Casing	Size O.D.	9.625 inches
		Size I.D.	8.921 inches
		Depth	1586 feet
		Weight	36.00 lbs/ft
1.5	Brine Casing	Size	4.5 inches
		Depth	1780 feet
		Weight	11.6 lbs/ft
1.6	Total Depth		1786 feet

2.0 TEST PRESSURES

2.1	Casing Seat Depth	1586	feet
2.2	Test Gradient	0.75	psi/ft
2.3	Brine Specific Gravity (Assumed)	1.20	
2.4	Product Specific Gravity (Diesel)	0.85	
2.5	Product Temperature	70	deg F
2.6	Interface Elevation	1626	feet
2.7	Casing Shoe Pressure	1190	psi
2.8	Surface Brine Pressure	359	psi
2.9	Surface Product Pressure	605	psi

3.0 VOLUME ESTIMATE

3.1	Total Volume To Casing Shoe	91	Bbls.
3.2	Volume From Casing Shoe to Interface	5	Bbls.
3.3	Total Product Required	96	Bbls.

4.0 COMPRESSIBILITY RESPONSE

4.1	Cavern Volume (estimate)	2,200,000	bbls
4.2	Displacement To Interface (Total 13B + 14A)	191	bbls
4.3	Cavern Compressibility	6.67	bbls/psi
4.4	Cavern Pressure Increase Due To Product Injection	14	psi
4.5	Cavern Pressure With Brine	345	psi
4.6	Brine Volume (estimate)	2300	bbls

M.I.T. WELL DATA SHEET

Rev. 2

1.0 WELL DESCRIPTION

1.1	Well Name		WELL #13B
1.2	Operator		Virginia Gas
1.3	Location	Field	Saltville
		County	Smyth
		State	Virginia
1.4	Cemented Production Casing	Size O.D.	9.625 inches
		Size I.D.	8.921 inches
		Depth	1621 feet
		Weight	36.00 lbs/ft
1.5	Brine Casing	Size	4.5 inches
		Depth	1765 feet
		Weight	11.6 lbs/ft
1.6	Total Depth		1773 feet

2.0 TEST PRESSURES

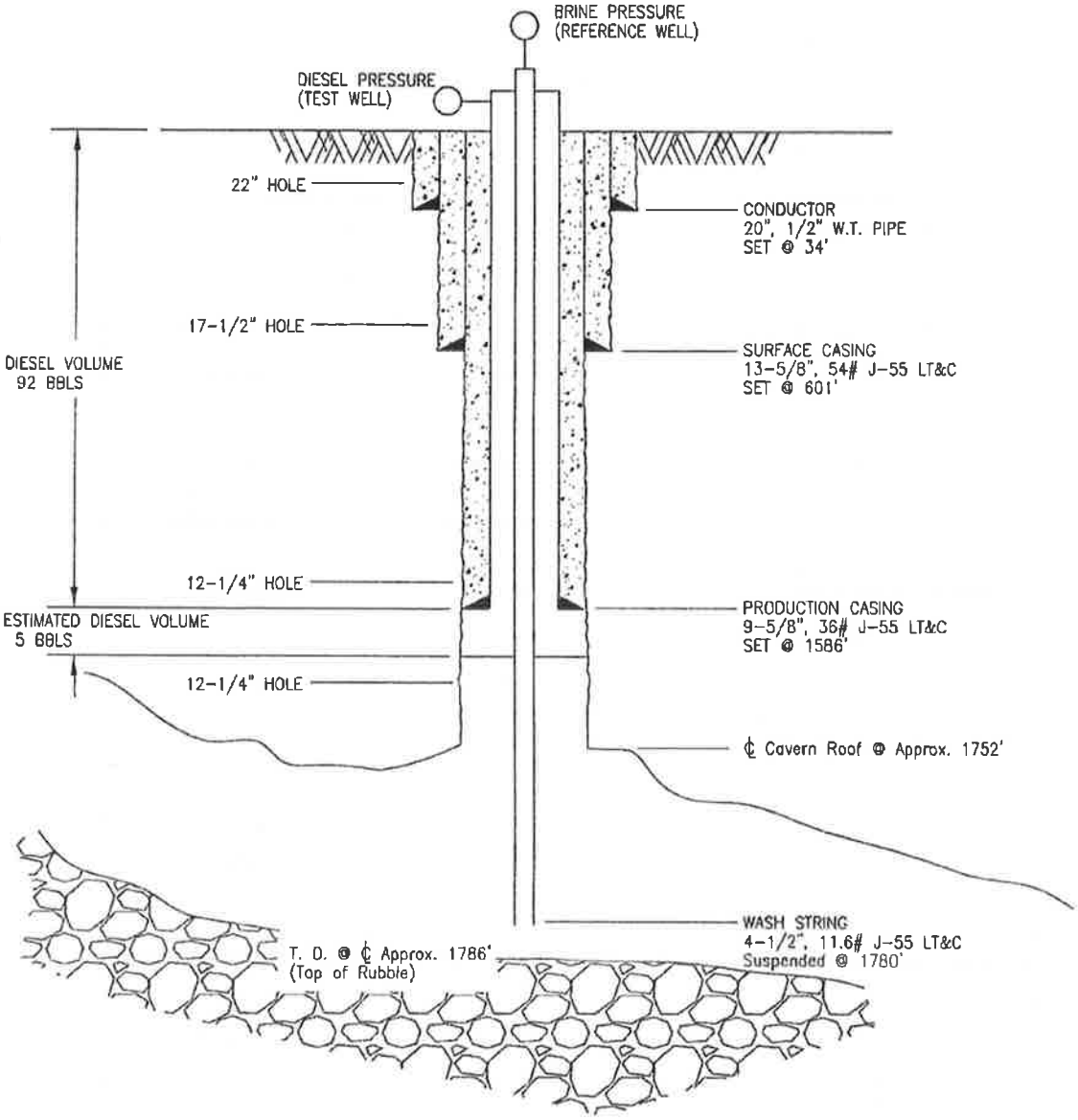
2.1	Casing Seat Depth	1621	feet
2.2	Test Gradient	0.75	psi/ft
2.3	Brine Specific Gravity (Assumed)	1.20	
2.4	Product Specific Gravity (Diesel)	0.85	
2.5	Product Temperature	70	deg F
2.6	Interface Elevation	1661	feet
2.7	Casing Shoe Pressure	1208	psi
2.8	Surface Brine Pressure	359	psi
2.9	Surface Product Pressure	611	psi

3.0 VOLUME ESTIMATE

3.1	Total Volume To Casing Shoe	93	Bbls.
3.2	Volume From Casing Shoe to Interface	2	Bbls.
3.3	Total Product Required	95	Bbls.

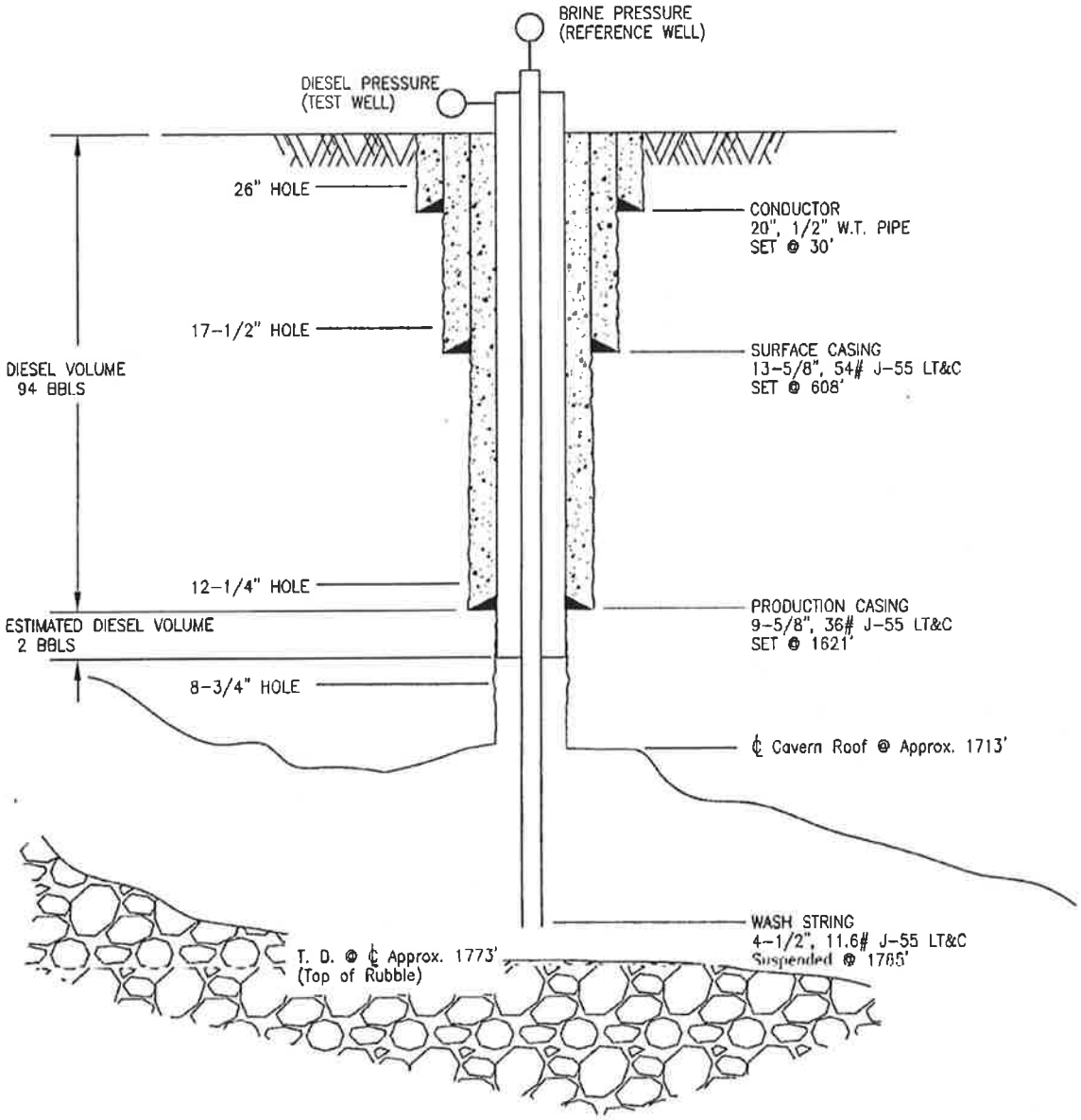
4.0 COMPRESSIBILITY RESPONSE

4.1	Cavern Volume (estimate)	2,200,000	bbls
4.2	Displacement To Interface	95	bbls
4.3	Cavern Compressibility	6.67	bbls/psi
4.4	Cavern Pressure Increase Due To Product Injection (See 14A)		psi
4.5	Cavern Pressure With Brine (See 14A)		psi
4.6	Brine Volume (estimate See 14A)	0	bbls



Notes:
1. All depths measured from BHF.
2. Reference PB ESS daily drilling reports.

PB Energy Storage Services, Inc. Engineering Construction Operations 11757 KATY FREEWAY #600 HOUSTON, TEXAS 77079	DUKE ENERGY GAS TRANSMISSION VIRGINIA GAS COMPANY SALTVILLE, VIRGINIA
SALTVILLE WELL CH-14A MIT WELL SCHEMATIC	JOB No. 50665B
DESIGN: TM / DRAWN: TJ / CHECKED: TM / DATE: 1/06 / SCALE: NONE	DRAWING No. 50665B-LC-002



Notes:
1. All depths measured from BHF.
2. Reference PB ESS daily drilling reports.

PB Energy Storage Services, Inc. Engineering Construction Operations 11757 KATY FREEWAY #600 HOUSTON, TEXAS 77079	DUKE ENERGY GAS TRANSMISSION VIRGINIA GAS COMPANY SALTVILLE, VIRGINIA
SALTVILLE WELL CH-13B MIT WELL SCHEMATIC	JOB No. 50665B

DESIGN:	DRAWN:	CHECKED:	DATE:	SCALE:	DRAWING No.
TM	TJ	TM	2/06	NONE	50665B-LC-004

INTRODUCTION

This program presents the program for the drilling of two re-entry wells in the Saltville Storage Field. The Saltville Storage Field is operated by Virginia Gas/Duke Energy. The purpose for drilling these two wells is to re-enter an existing salt cavern gallery for brine production. This program presents objectives, assumptions, and a proposed drilling plan. This document serves as an outline and a guide to all field activities. The completion of field activities may require additional information and resources not outlined in this document. All changes to this scope and additionally activities will require the notification and approval of Virginia Gas/Duke Energy.

PROJECT CONTACT INFORMATION

Scott Hill – Virginia Gas/Duke Energy Manager

- Office – (276) 676 2380
- Cell – (276) 623-6244

Tim Moran – PB Energy Storage Services, Inc. Project Manager

- Office – (281) 589-5823
- Cell – (281) 382-9489

Mark Hansen – PB Energy Storage Services, Inc. Procurement Manager

- Office – (281) 589-5828
- Cell – (281) 414-0952

Tommy Musselwhite – PB Energy Storage Services, Inc. Field Supervisor

- Cell (713) 703-5367

DRILLING PROGRAM

1.0 Permits

Ensure all appropriate local, state, and federal permits have been submitted

2.0 Pre-spud Meeting

Obtain VG/Duke approval prior to starting drilling activities – hold a pre-spud/drill meeting with principal parties and vendors via conference call

3.0 Prepare Location and Cavern

1. Clear out area for rig
2. Survey the drilling locations
3. Ensure that the EPA is notified of intent to drill

4. Ensure that cavern pressure has been bled down to atmospheric from Wells CH-13 & 14.

4.0 Drilling Activities

1. Move in and rig up an appropriate sized drilling rig
2. Install mud system and mix up drilling fluids.
3. Drill a 24" hole to 40' +/-
4. Run and cement 20" conductor casing
5. Wait on cement 12 hours
6. Install a 20" 3M X 13-5/8" temporary SOW flange
7. Install 20" 3M 3M Hydril
8. Test casing to 30 psi for 30 minutes. A 10% drop (6 psi) is allowable
9. Test Hydril (low pressure and high pressure)
10. Drill out cement and drill 17-1/2" hole to 600' +/-.
11. Run an X-Y caliper to determine hole size and run GR/N log.
12. Run and cement 13-3/8" casing using 50% excess above calculated volume
13. Remove 20" 3M flange
14. Install 13-5/8" 2M casinghead flange
15. Install 13-5/8" 2M X 13-5/8" 3M DSA
16. Install 13-5/8" 3M Hydrill
17. Wait on cement 24 hours
18. Test casing to 250 psi for 30 minutes. A 10% drop (25 psi) is acceptable.
19. Drill out cement and drill 12-1/4" hole 10' below 13-3/8" casing shoe.
20. Circulate the hole clean.
21. Rig up to drill with air then blow hole dry.
22. Continue air drilling 12-1/4" hole to approximately 1500'. (The approximate depth of 13-3/8" casing in CH-13 & 14).
23. Drill remaining hole with brine.
24. Drill 12-1/4" hole into the cavern . Extreme care should be taken when nearing the anticipated cavern roof at 1750' +/-
25. Rig up wireline unit and run GR/N and X-Y caliper logs.

26. Based on the results from these logs, set a PIP inflatable bridge plug as close to the cavern roof as possible.
27. Spot 10 to 20 feet of sand on PIP
28. Spot 50 feet of cement on top of sand. (Use same cement mix as upper and lower bench wells.)
29. Wait on cement 12 hours.
30. Tag cement with workstring and test to 500 psi for 30 minutes
31. Run in hole with 9-5/8" casing to 20 feet above cement.
32. Cement to surface with 150% of calculated volume. Use same cement mix as Upper and Lower Bench wells.
33. Wait on cement minimum 48 hours. (Check cementing contractor recommendation)
34. Test casing to 500 psi for 30 minutes. A 10% (50 psi) loss or less is acceptable.
35. Drill out cement.
36. Wash out sand and recover PIP. (Note: If PIP cannot be recovered, burn over and push into cavern.)
37. Rig up wireline unit and run a cement bond log and cavern sonar survey.
38. Nipple up casing head spool.
39. Run in hole with 4-1/2" to top of rubble
40. If it is necessary to drill 4-1/2" casing into the rubble
    - Run casing in with bit and float sub.
    - Rotate into rubble with minimum weight to desired depth or point of refusal.
    - Rig up wireline and perforate 4-1/2" casing above float.
41. Nipple up remainder of wellhead
42. Rig down and move out.

SAFETY

- Port-a-lets should be spotted on location prior to start of drilling operations and maintained throughout the project
- MSDS should be on location with workover supervisor prior to start of activity. All personnel must be aware of MSDS location(s)
- Emergency showers and eye wash stations must be on location throughout workover
- All safety incidents are to be reported, documented, and investigated by PB ESS and VNG/Duke
- All PPE to include hard hat, steel toe boots, and safety glasses
- Smoking in designated areas only
- Daily safety (tailgate) meeting to review the daily work activities and safety hazards
- Prepare specifications and reporting requirements for all pressure tests and function tests
- Site supervisor to prepare and submit daily field activity reports and cost estimates